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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,381	12/30/2003	Kazuaki Ano	TI-36576 (032350.B569)	8152

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TEXAS INSTRUMENTS INCORPORATED  
P O BOX 655474, M/S 3999  
DALLAS, TX 75265

EXAMINER
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BEVERIDGE, RACHEL E

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 10/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/748,381	<b>Applicant(s)</b> ANO, KAZUAKI	
	<b>Examiner.</b> Rachel E. Beveridge	<b>Art Unit</b> 1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 13-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-20 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Election/Restrictions*

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-12, drawn to a method for applying solder paste to a circuit board, classified in class 228, subclass 248.1.
- II. Claims 13-20, drawn to a system for applying solder paste to a circuit board, classified in class 361, subclass various.

The inventions are distinct, each from the other because of the following reasons:

Inventions Group I and Group II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus can be used for adhesive bonding.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Sam Tung on September 21, 2005 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-12. Affirmation of this election must be made by applicant in replying to this Office action. Claims 13-20 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

***Drawings***

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Figure 3(110), Figure 5(40), and Figure 8(820). They also, include the following reference character(s) not mentioned in the description: Figure 8(800). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 8 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

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The specification and drawings do not disclose how the second stencil height can be less than the first stencil height if the disclosed void enclosure of the second stencil must be a greater height than that of the first stencil's solder deposits.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear how the second stencil height can be less than the first stencil height if the disclosed void enclosure of the second stencil must be greater than that of the first stencil's solder deposits. For examination the examiner interpreted the shorter stencil height to encompass the portion of stencil above the void enclosure (section 40 above section 55 of applicants drawings).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2,4,7,and 9-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Thompson, Sr. (US 5,740,730).

With respect to claim 1, Thompson discloses a first material deposited onto a PCB through a first stencil with a plurality of first openings, forming a plurality of first pads on the board (Column 2, lines 25-27). Thompson also discloses a second stencil

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positioned on the PCB with a plurality of second openings and at least one recess in its bottom face for receiving the first pads (Column 2, lines 28-31). Furthermore, Thompson discloses the second material is deposited onto the board through the second openings of the second stencil (Column 2, lines 34-35). Figure 8(156) also shows a void for shielding of the first solder deposits as disclosed by Thompson in column 6, line 14.

Regarding claim 2, Thompson states that the “recesses have depths  $D$  at least as great as the thickness  $T_1$  of the first stencil” (Column 2, lines 47-48). Thompson also discloses that the second stencil is positioned over the PCB so that the first pads are positioned in the recess and the second pads are deposited on the PCB through the second stencil (Column 2, lines 52-55). Furthermore, Thompson discloses “the depth to which the recesses are etched is typically greater than height  $h_1$  of the solder pads 48 (shown in FIG.3) so that the second stencil 50 does not deform the solder pads 48 when it is positioned over the solder pads 48” (Column 4, lines 64-67 and Column 5, line 1).

With regard to claim 4, Thompson discloses that the recesses are sized and shaped to receive the solder pads without contacting the solder pads (Column 4, lines 51-53). With regard to claim 7, Thompson discloses “the depth to which the recesses are etched is typically greater than height  $h_1$  of the solder pads 48 (shown in FIG.3) so that the second stencil 50 does not deform the solder pads 48 when it is positioned over the solder pads 48” (Column 4, lines 64-67 and Column 5, line 1).

Regarding claim 9, Thompson discloses solder paste used for surface mounting components onto a PCB in a pattern of solder pads, which have high strength and reflow at high temperatures (Column 1, lines 34-39). With respect to claim 10, Thompson discloses a first material deposited onto a PCB through a first stencil with a plurality of first openings, forming a plurality of first pads on the board (Column 2, lines 25-29). Thompson also discloses a solder mounting process deposit in a first pattern using a first stencil and a second pattern using a "mechanical syringe" (Column 1, lines 54-56). The dictionary defines a needle as a slender bar of which also encompasses a syringe. Therefore, it was interpreted by the examiner that a mechanical syringe satisfies the claimed "solder needle".

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3,8, and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson, Sr. (US 5,740,730).

With respect to claim 3, Thompson shows second stencils with different sizes and shapes of the solder deposit areas in figures 4B-4D. Furthermore, Thompson discloses the second stencils have different sized and shaped second openings including larger diameters than others (Column 5, lines 12-17). Thompson also discloses varying size and shapes for the first openings of the first stencil (Column 3,

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lines 60-65). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include larger diameter solder deposits for the second stencil in order to accommodate a larger component at that section of the PCB (Column 5, lines 24-27).

With regard to claim 8, the examiner interpreted the shorter stencil height to encompass the portion of stencil above the void enclosure (section 40 above section 55 of applicants drawings). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a thinner second stencil in order to reduce the material cost of the stencil to reduce the manufacturing cost (Column 1, lines 10-21 and Column 4, lines 5-15).

With respect to claim 11, Thompson shows second stencils with different sizes and shapes of the solder deposit areas in figures 4B-4D. Furthermore, Thompson discloses the second stencils have different sized and shaped second openings including larger diameters than others (Column 5, lines 12-17). Thompson also discloses varying size and shapes for the first openings of the first stencil (Column 3, lines 60-65). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include larger diameter solder deposits for the second stencil in order to accommodate a larger component at that section of the PCB (Column 5, lines 24-27).

Regarding claim 12, Thompson shows second stencils with different sizes and shapes of the solder deposit areas in figures 4B-4D. Furthermore, Thompson discloses the second stencils have different sized and shaped second openings including larger



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diameters than others (Column 5, lines 12-17). Thompson also discloses varying size and shapes for the first openings of the first stencil (Column 3, lines 60-65). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include smaller diameter solder deposits for the second stencil in order to accommodate a smaller component at that section of the PCB (Column 5, lines 24-27).

Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson, Sr. (US 5,740,730) as applied to claim 1 above, and further in view of Chung (US 6,316,289 B1).

With respect to claim 5, Thompson discloses varying size and shapes for the first openings of the first stencil (Column 3, lines 60-65) and that the size and shape of the "second openings" are not limited to those disclosed in FIGS. 4A-4D and may include other suitable sizes and shapes (Column 5, lines 24-27). Figures 4A-4D(58), which Thompson defines as "alignment fiducials," and it was interpreted by the examiner that these structures can also be placed within the void area for alignment of the stencil. These fiducials can be of different shapes and sizes by the broad definition of "second openings" and therefore can be a pocket within the void enclosure. However, Thompson lacks disclosure of a support like structure within the fiducials. Chung discloses alignment holes of the substrate (Chung, figure 3(126) and column 8, line 1) and of the standoff stencil (Figure 3(106) and column 8, line 4). Chung claims alignment pins through each alignment hole (Claim 12, column 19, lines 8-12). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include supports within the void area of the second stencil in order to

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properly align and support the second stencil in relation to the PCB (Chung, column 8, lines 1-9).

Regarding claim 6, Thompson discloses varying size and shapes for the first openings of the first stencil (Column 3, lines 60-65) and that the size and shape of the "second openings" are not limited to those disclosed in FIGS. 4A-4D and may include other suitable sizes and shapes (Column 5, lines 24-27). Figures 4A-4D(58), which Thompson defines as "alignment fiducials," and it was interpreted by the examiner that these structures can also be placed within the void area for alignment of the stencil. These fiducials can be of different shapes and sizes by the broad definition of "second openings" and therefore can be a pillar within the void enclosure. However, Thompson lacks disclosure of a support like structure within the fiducials. Chung discloses alignment holes of the substrate (Chung, figure 3(126) and column 8, line 1) and of the standoff stencil (Figure 3(106) and column 8, line 4). Chung claims alignment pins through each alignment hole (Claim 12, column 19, lines 8-12). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include supports within the void area of the second stencil in order to properly align and support the second stencil in relation to the PCB (Chung, column 8, lines 1-9).

### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rachel E. Beveridge whose telephone number is (571) 272-5169. The examiner can normally be reached on Monday through Friday, 8:30 am to 5 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Dunn can be reached on (571) 571-1171. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

REB

  
JONATHAN JOHNSON  
PRIMARY EXAMINER